
APPLICATION FOR UNITED STATES LETTERS PATENT

for

HOSE NOZZLE

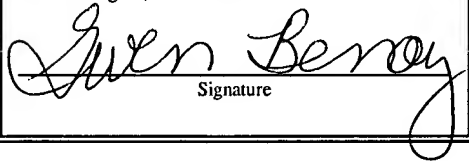
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HOSE NOZZLE

FIELD OF INVENTION

2 This invention relates to hose nozzles. More
specifically, this invention relates to a manually actuable
4 hose nozzle allowing comfortable operation with one hand.

BACKGROUND OF INVENTION

6 Garden hoses are commonly known irrigation
devices. In order to direct the water stream from the hose
8 end in a variety of patterns such as a jet stream or a cone
shaped spray, screw-on hose nozzles have been devised.
10 Typical hose nozzles come in two varieties: 1) barrel type
hose nozzles and 2) pistol-grip hose nozzles. The barrel
12 type hose nozzle is usually in the form of a generally
cylindrical body. One end of the body is adapted to be
14 connected to the garden hose and the opposite end defines
the nozzle from which the water stream issues. The body has
16 a forward cylindrical element which may be retracted or
extended in relation to a rear cylindrical element by
18 rotating the forward cylindrical element. The pattern of
the water stream issuing from the nozzle may be adjusted by
20 rotating the forward cylindrical element into different
positions. The flow rate of the water stream issuing from

the nozzle is also related to the position of the forward
cylindrical element.

The use of two hands is required in order to
position the forward element. One hand is used to hold the
hose and the other is used to turn the forward barrel
element with respect to the rearward element. The range of
adjustment allows for variation of the water stream pattern
issuing from the nozzle orifice and the flow rate. However,
using two hands to control the water stream is cumbersome to
the user and does not provide simultaneous use of a free
hand.

In contrast, a typical pistol-grip nozzle includes
a tubular body having a handle portion connectable at one
end to the garden hose. The body has a fixed barrel portion
extending from the opposite end of the hose connector at an
angle similar to the angle between the handle and barrel of
a pistol. The water stream issues from the nozzle at the
forward end of the barrel. The pattern and flow rate of the
water stream is determined by a valve stem extending through
the barrel portion and outwardly through the rear end
thereof. The movement of the stem is controlled by a
pivoted actuating lever which includes a portion generally

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parallel with the handle of the nozzle body enabling the
2 user to grip the handle portion and actuating lever and to
adjust the water stream issuing from the nozzle by a simple
4 squeezing action. Usually, a pivoted bail is provided for
holding the actuating lever and adjusting stem in any
6 desired position. Certain pistol-grip type hose nozzles
allow a user to separately control the pattern of the water
8 stream and the flow rate but require two handed operation.

501500 "Hose Nozzles"
10 An advantage of the pistol-grip type hose nozzle
in comparison with the barrel type hose nozzle is the ease
with which the stream varying structure may be moved into
12 and out of its fully closed position from and into any
operating position. Additionally, a user may operate the
14 pistol nozzle with only one hand since only one hand is
required both to hold the nozzle and squeeze the lever to
16 actuate the water stream. However, the user has to hold the
actuating lever against a spring action in the operating
18 position or operate the bail to maintain the desired water
stream pattern. In contrast, barrel type nozzles are self-
20 maintained in any position of adjustment into which they are
moved. Also, the pistol type grips are generally more
22 complex and costly to manufacture than barrel type nozzles.

Finally, the pistol-grip nozzle requires a user's arm to be
2 extended in order to direct the water stream from the
nozzle. This results in fatigue since the user's arm must
4 be raised to direct the water stream from the nozzle.

Thus, there exists a need for a simple barrel type
6 hose nozzle which will allow adjustment of the water stream
with one hand. There is also a further need for a simple
8 barrel type hose nozzle which allows a user to set the force
and pattern of the water stream with one hand. There is
10 also a need for a barrel type hose nozzle with an ergonomic
grip for the comfort of a user's hand. There is
12 additionally a need for a barrel type hose nozzle which
allows direction of a water stream without exerting a user's
14 arm.

SUMMARY OF THE INVENTION

16 The present invention is embodied in a hose nozzle
for use with a hose having one end connected to a fluid
18 source and an opposite connector end. The hose nozzle has a
hollow body having a connector end mateable with the
20 connector end of the hose and a hand grip shaped to fit a
user's hand. A fluid flow pattern varying assembly is



located in sufficient proximity to the hollow body to allow
2 manual actuation by a user's index finger and thumb. An
outlet member is coupled to the fluid flow pattern varying
4 assembly. The hollow body permits fluid flow on the manual
actuation of the fluid flow pattern varying assembly. A
6 fluid passage extends through the hollow body permitting
fluid to flow from the hose to the outlet member.

8 More specifically, the invention is directed
toward a hose nozzle for controlling and varying a water
10 stream from a hose. The hose has one end fluidly coupled to
a pressurized water source and an opposite open end. The
12 hose nozzle has a generally tubular body with a connector
end coupled to the opposite open end of the hose. The
14 tubular body has an interior cylindrical passage permitting
flow of water from the hose through the tubular body. The
16 tubular body also has a hand grip. An inner stem member is
coupled to the end of the tubular body opposite from the
18 connector end. The inner stem member has one open end
permitting passage of water therethrough. The inner stem
20 member also has an opposite closed end and an orifice
permitting passage of water therethrough proximate the
22 opposite closed end. The inner stem member also has a

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beveled cylinder on the closed end and a threaded exterior
2 surface proximate the open end. An outer sleeve member has
an open end with a threaded interior surface intermeshed
4 with the threaded exterior surface of the inner cylinder.
This permits the outer sleeve member to be retracted or
6 extended in relation to the inner stem member by rotating it
about the inner stem member. The outer sleeve member has an
8 end wall opposite the open end with an aperture with a
sufficient diameter to allow the passage of a portion of the
10 beveled cylinder. The hand grip is shaped to allow a user's
hand to hold the tubular body and rotate the outer sleeve
12 member.

It is to be understood that both the foregoing
14 general description and the following detailed description
are not limiting but are intended to provide further
16 explanation of the invention claimed. The accompanying
drawings, which are incorporated in and constitute part of
18 this specification, are included to illustrate and provide a
further understanding of the method and system of the
20 invention. Together with the description, the drawings
serve to explain the principles of the invention.

BRIEF DESCRIPTION OF DRAWINGS

2 FIG. 1 is a perspective view of a hose nozzle in a
closed position according to the present invention.

4 FIG. 2 is a side view of the hose nozzle of FIG. 1
in a closed position according to the present invention.

6 FIG. 3 is a side view of the hose nozzle of FIG. 1
in an open position according to the present invention.

8 FIG. 4 is a side view of the hose nozzle of FIG. 1
according to the present invention in relation with the hand
10 of a user.

12 FIG. 5 is a cross section view of the hose nozzle
of FIG. 1 according to the present invention in a closed
position.

14 FIG. 6 is a cross section view of the hose nozzle
of FIG. 1 according to the present invention in an open
16 position.

18 **DESCRIPTION OF THE PREFERRED EMBODIMENT**

20 While the present invention is capable of
embodiment in various forms, there is shown in the drawings
and will hereinafter be described a presently preferred
22 embodiment with the understanding that the present
disclosure is to be considered as an exemplification of the

invention, and is not intended to limit the invention to the
specific embodiment illustrated.

Referring now to the drawings and more particularly to FIGs. 1-3 which show perspective and side views of a hose nozzle generally indicated at 10, embodying the general principles of the present invention. In general, the hose nozzle 10 includes a hollow body member such as a generally tubular body 12 adapted to be connected to one end of a hose 14. The hose 14 is a typical garden hose having its opposite end connected to a fluid source such as a water spigot (not shown). The hose nozzle 10 has an outlet member 16 which has a manually actuable flow pattern varying assembly 18. The tubular body 12 and outlet member 16 are operable to receive water under pressure from the hose 14 at a flow rate determined by the manually activated flow rate varying assembly 18. The barrel portion 16 issues the water stream with different stream patterns and force determined by the position of the manual actuation assembly 18 in relation to the tubular body 12.

The exterior of the tubular body 12 has an integral hand grip 20. The hand grip 20 and the tubular body 12 are ergonomically shaped to permit the grasp of a

user's hand as shown in FIG. 4. The tubular body 12 has an
2 angled portion 22 which is connected to the barrel portion
16. The hand grip 20 is preferably made of a resilient and
4 soft material such as rubber or an elastomeric polymer in
order to facilitate the gripping of the tubular body 12.
6 The grip 20 is of sufficient thickness to provide a user's
hand insulation from the temperature of the water flowing
8 through the tubular body 12. The hand grip 20 has three
finger notches 24, 26 and 28 which facilitate the placement
10 of a user's fingers holding the nozzle 10. The hand grip 20
is of sufficient length to allow the tubular body 12 to fit
12 within an average user's hand as shown in FIG. 4. The hand
grip 20 may have other shapes which allow the comfortable
14 gripping of the body 12 by a user's hand.

Returning to FIGs. 1-3, the tubular body 12 has an
16 open end portion 30 which is connectable to the hose 14.
The open end portion 30 has an interior surface 32 which is
18 formed with hose end connecting means such as female threads
34 of a size to intermesh with male threads 36 on a typical
20 connector end fitting 38 on the hose 14. The threads 34
form a part of a water passage 40 which extends through the
22 open end portion 30, through the tubular body 12 and the

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outlet member 16 of the nozzle 10. Of course, other means
2 of connection to a hose may be used instead of the male and
female coupling threads if desired.

4 The manually actuatable flow pattern varying
assembly 18 includes an annular collar 42 and an outer
6 sleeve member 78 which are disposed on a closed end 44 of
the tubular body 12 opposite from the open end portion 30.
8 The annular collar 42 and the outer sleeve member may be
extended or retracted relative to the tubular body 12 by
10 rotation. The flow pattern varying assembly 18 is used to
vary the flow rate of water under pressure confined within
12 the water passage 40 between zero and maximum. Thus, when
the annular collar 42 and outer sleeve member 78 are in a
14 retracted position as shown in FIGs. 1 and 2, water flow
from the nozzle 10 is zero. When the annular collar 42 and
16 outer sleeve member 78 are in the fully extended position as
shown in FIG. 3, water flow from the nozzle 10 is at
18 maximum. The annular collar 42 has a beveled exterior
surface 46 with a series of ridges 48 to facilitate gripping
20 by the user. In the preferred embodiment, the annular
collar 42 is made of plastic although any sturdy, waterproof
22 material such as brass or zinc alloy may be used.

In the position relative to the placement of the
2 user's fingers on the finger notches 24, 26 and 28 of the
handgrip 20, the user's thumb and forefinger are naturally
4 extended to grip the beveled exterior surface 46 of the
annular collar 42. In this regard, it will be noted that
6 the exterior surface of the hand grip 20 has a top surface
area 50 in a position opposed to the finger grip notches 24,
8 26 and 28 on the bottom surface of the hand grip 20. The
top surface area 50 is shaped to accommodate a user's palm
10 as shown in FIG. 3. With this arrangement, it will be noted
that the exterior surface of the hand grip 20 will
12 accommodate either a right hand grip or a left hand grip
with equal facility so as to accommodate the particular
14 dexterity of any particular user.

FIGs. 5 and 6 are cross sectional views of the
16 nozzle 10 in a closed and open position respectively. Like
elements in FIGs. 5 and 6 have identical numbers as in FIGs.
18 1-3. The interior of the tubular body 12 contains a shaped
cylindrical member 60. The cylindrical member 60 is
20 preferably a water resistant material such as plastic or
zinc alloy.

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The cylindrical member 60 has a connector portion
2 62 which contains the female threads 34 and forms the first
part of the water passage 40. The hose end connector 38 of
4 the hose 14 is twisted into the connector portion 62. The
connector portion 62 has an annular shoulder 64 which serves
6 to stop the hose end connector 38 of the hose 14. An
elastomeric hose washer 66 is inserted on the annular
8 shoulder 64 to facilitate sealing the annular shoulder 64 to
the hose end connector 38.

10 The cylindrical member 60 has a smooth interior
surface 68 which forms a cylindrical passage for the water
12 passage 40 to proceed through the tubular body 12. The
water passage 40 is bent at an angle to follow the
14 cylindrical member 60, and the angle portion 22 of the
tubular body 12. An exterior surface 70 of the cylindrical
16 member 60 has a series of annular ridges 72 which rest in
similar notches on the hand grip 20. The combination of the
18 annular ridges 72 and the notches on the hand grip 20 serve
to securely hold the hand grip 20 to the cylindrical member
20 60. Alternatively, the cylindrical member 60 and hand grip
20 may be a single piece. The single piece may be made of

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zinc or a rigid plastic such as by injection or blow molding.

2 The outlet member 16 extends from the closed end
44 of the tubular body 12 and provides an outlet 74 for a
4 pressurized stream of water from the hose 14. The outlet
member 16 includes an inner stem member 76. The outer
6 sleeve 78 is placed circumferentially around the inner stem
member 76. Both the inner stem member 76 and outer sleeve
8 member 78 are preferably water resistant material such as
brass or plastic in the preferred embodiment.

10 Alternatively, other materials such as zinc alloy may be
used. The annular collar 42 is fixedly attached to the
12 exterior surface of a rear portion 80 of the outer sleeve
member 78 by means of friction from a knurled contact
14 surface (not shown) on the outer sleeve member 78.
Alternatively, the annular collar 42 may be attached to the
16 outer sleeve member 78 as a mold insert. The annular collar
42 and the outer sleeve member 78 may also be fabricated as
18 a single piece. A forward portion 82 of the outer sleeve
member 78 extends from the annular collar 42 and forms the
20 outlet 74.

The inner stem member 76 has a base portion 84.

22 The base portion 84 is hollow and serves as the continuation

of the water passage 40. The base portion 84 has a threaded
2 exterior surface 86. The base portion 84 of the inner stem
member 76 is coupled to a tube portion 88. The tube portion
4 88 is hollow and terminates the water passage 40. The base
portion 84 has a wider diameter than that of the tube
6 portion 88. The inner stem member 76 has a solid beveled
cylinder 90 whose wider end closes the tube portion 88. The
8 opposite end of the beveled cylinder 90 has a cap 91, which
in conjunction with the beveled cylinder 90, serves to
10 direct water flow from the outlet end 74 of the barrel
portion 16. An orifice 92 is located on the tube portion
12 88. The orifice 92 allows water in the water passage 40 to
escape the interior of the inner stem member 76.

14 The outer sleeve member 78 has a threaded interior
surface 94 which is meshed with the threaded exterior
16 surface 86 of the inner stem member 76. The outer sleeve
member 78 and the attached annular collar 42 thus may be
18 extended or retracted in relation to the inner stem member
76 and the tubular body 12 by the user rotating the annular
20 collar 42 in a clockwise or counter clockwise-direction.

The inner stem member 76 has an annular stop 96 on
22 its exterior surface behind the orifice 92. An O-ring 98 is

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installed around the exterior surface of the inner stem
2 member 76 in front of the threaded exterior surface 86. The
outer sleeve member 78 may be extended by rotation to the
4 point where the O-ring 98 contacts the annular stop 96. The
combination of the annular stop 96 and the O-ring 98 thus
6 prevents the outer sleeve member 78 from becoming detached
from the inner stem member 76.

8 The outer sleeve member 78 is closed by an end
wall 100 which has an aperture 102 which is approximately
10 the same diameter as the beveled cylinder 90 of the inner
stem member 76. The end wall 100 has a beveled outer
12 surface 104 around the aperture 102. The beveled outer
surface 104 in conjunction with the beveled cylinder 90 and
14 cap 91 serves to direct the water stream in a spray pattern.
The end wall 100 also has a flat inner surface 106 which
16 contacts the beveled cylinder 90 when the outer sleeve
member 78 is in a retracted position.

18 The space between inner stem member 76 and outer
sleeve member 78 forms a cavity 108 which provides fluid
20 access through the orifice 92 to the water passage 40. When
the outer sleeve member 78 is fully retracted, the beveled
22 cylinder 90 of the inner stem member 76 partially extends

through the aperture 102. The beveled cylinder 90 in
2 combination with the inner surface 106 of the end wall 100
prevents water forced into the cavity 108 by water pressure
4 from flowing out of the aperture 102. The O-ring 98 forms a
seal between the interior of the outer sleeve member 78 and
6 the exterior of the inner stem member 76. Thus, water in
the cavity 108 cannot flow out through the threaded surfaces
8 86 and 94.

When the outer sleeve member 78 is extended as
10 shown in FIG. 6, the aperture 102 and the end wall 100 are
moved forward, allowing passage of water from the cavity 108
12 around the beveled cylinder 90 and through the aperture 102.
The water is forced out from the water flow in the hose 14
14 which is propelled through the water passage 40, through the
orifice ⁹²~~100~~, the water cavity 108, and out the aperture 102.

As shown in FIG. 4, the finger notches 24, 26 and
16 28 allow a user to grasp the hose nozzle 10 with three
18 fingers around the hand grip 20. Due to the orientation of
the tubular body 12 and the angled portion 22, the user's
20 thumb and index finger rest naturally on the annular collar
42. By rotating the annular collar 42 by using the thumb
22 and index finger, the user is able to extend the outer

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sleeve member 78 in relation to the inner stem member 76 and
the tubular member 12 as shown in FIGs. 3 and 6. This
changes the pattern of the water stream emitted from the
outlet 74. The water stream pattern is determined by the
position of the beveled cylinder 90 and cap 91 in relation
to the beveled surface 104 of the outer sleeve member 78.
The water stream pattern may range from a cone shaped spray
when the outer sleeve member 78 is almost fully retracted to
a jet stream when the outer sleeve member 78 is fully
extended.

The intermeshing threads 86 and 94 on the inner
stem member 76 and outer sleeve member 78 allow the annular
collar 42 and the attached outer sleeve member 78 to be
fixed at any position between the fully extended position
and the fully retracted position. In this manner, a variety
of water spray patterns may be controlled by the user
without maintaining pressure from the thumb and index finger
on the annular collar 42.

The present invention allows a user to operate the
hose nozzle 10 using either hand. The resilient and soft
material of the hand grip 20 over the tubular portion 12 as
well as the angled shape allows a soft and comfortable hold

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for the user. Additionally, the handgrip 20 insulates a
2 user's hand from the temperature of the water flowing
through the tubular body 12. The angled portion 22 of the
4 tubular body 12 allows the water stream issued from the
nozzle 10 to be directed toward an area by simply pivoting
6 the user's wrist with the arm in a vertical position. This
prevents fatigue to the user's arm.

8 It will be apparent to those skilled in the art
that various modifications and variations can be made in the
10 method and system of the present invention without departing
from the spirit or scope of the invention. Thus, the
12 present invention is not limited by the foregoing
descriptions but is intended to cover all modifications and
14 variations that come within the scope of the spirit of the
invention and the claims that follow.

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